HETEROGONY IN ANDRICUS CRYSTALLINUS BASSETT

(Hymenoptera: Cynipidae)

RICHARD L. DOUTT

University of California, Albany

Heterogony is suspected to exist in certain California species in the genera *Loxaulus* and *Antron* (Weld, 1957), and was proved to occur in *Dryocosmus* (Doutt, 1959), and *Callirhytis* (Lyon, 1959). Recent studies now include the genus *Andricus* among those exhibiting an alternation of generations.

Fallen leaves of the deciduous blue oak, *Quercus Douglasii* H. & A., bearing galls of *Andricus crystallinus* Bassett were collected on Mt. Diablo, Contra Costa Co., California on February 4, 1959. The fact that many of the galls showed emergence holes indicated a strong possibility that an alternating generation must exist for no leaves are on the trees in February and it seemed logical that the emerging females would not hibernate but instead would oviposit in some part of the dormant tree. Adult female *Andricus crystallinus* began emerging in the laboratory on February 5 and were caged on small dormant seedlings of *Q. Douglasii* on February 6. Oviposition occurred immediately in the tight leaf buds. The seedlings were then kept under daylight fluorescent lamps at a constant temperature of 78° F. and a relative humidity of 65%. Within five days the buds had opened and the leaves were rapidly expanding. On February 16 (ten days after oviposition) small, green, conical, monothalamous galls with laterally projecting cottony fibers (Figure 1) were evident on the leaves. On February 23 (17 days after oviposition) emergence of both male and female *Andricus* occurred. These adults of the bisexual generation, morphologically distinct from the unisexual or agamic generation of *A. crystallinus*, oviposited in the fully expanded leaves of the blue oak. It is from these eggs that the unisexual generation is formed in the pinkish, crystalline galls (Figure 2) which are so characteristic of this species in the summer months. In this experimental study the unisexual galls required 130 days to reach their full development on the leaves.

Since the bisexual generation has not been previously recognized, a brief description of the morphological and biological characteristics of these insects is appropriate.

ANDRICUS CRYSTALLINUS Bassett, bisexual generation.

Female.—Body entirely black, legs except coxae golden brown, coxae

black. Antennae dark brown except basal four segments which are golden. Maxillary and labial palpi pallid. Wings hyaline with slight infuscation near break in median vein, areolet small, veins smoky brown. Head viewed dorsally nearly as wide as thorax, but frons very short. Surface minutely punctate with scattered short hairs. Eyes and ocelli jet black. Antennae with 14 segments. Mesoscutum smooth, shining, parapsidal sutures well developed, no median suture. Scutellum dull, rugose, clothed with scattered hairs. Mesopleura smooth, shiny. Abdomen polished, few scattered hairs near petiole, larger than head and thorax combined, segments all visible dorsally, segment II forming less than one half of the abdomen, ventral spine slender, ovipositor brown. Tarsal claws toothed.

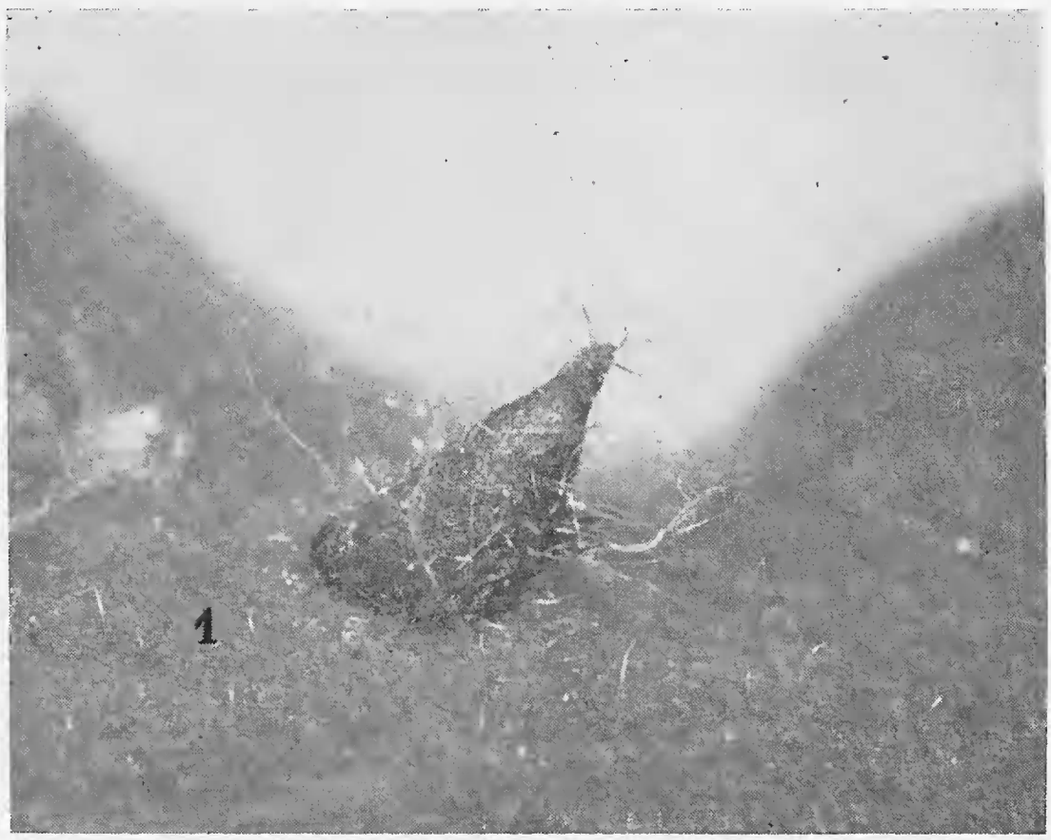
Male.—Color as in female except all antennal segments dark brown, abdomen near apex tends to be more brown than black as in female. Compound eyes large, reaching three-fourths way down head. Frons wider than female. Third antennal segments distinctly longer than fourth; (this is not so apparent in the female). Antennae with 15 segments. Abdomen smaller than thorax. Areolet present but small. Legs more slender in male than female.

The female of the bisexual generation is readily distinguished by color and size from the unisexual or agamic female which is basically reddish amber with black areas on portions of thorax, head, and abdomen, and of larger size. The mesoscutum of the agamic female is minutely punctate, dull, clothed with numerous white hairs. Segment II of abdomen is quite large, forming nearly 2/3 of the abdomen. Wings tend to be slightly infuscated near base.

Gall.—The galls in which the bisexual generation of *Andricus crystallinus* develops are found mostly on the upper surface of leaves, singly or in small groups. The color is green with straw colored apex. The gall has many long cottony, white hairs which project laterally and are longer than the greatest dimension of the gall. The gall is conical in shape, and distinctly canted to one side rather than being erect (Figure 1). The length is approximately 2.5 mm. with the base 1.0 mm. tapering to the tip. The position of the gall is indicated on the opposite (usually lower) side of the leaf by a pale colored elliptical swelling. Emergence takes place from uppermost side of the slanted, conical gall. The gall has a single chamber.

Host.—The insects described herein were reared on *Quercus Douglasii,* but since the unisexual generation has been taken on other white oaks including *Q. dumosa,* and *Q. garryana* it is likely that the bisexual form may be found on them also.

Plesiotypes.—The specimens used in the above description



EXPLANATION OF FIGURES

Figure 1. Typical gall produced by the bisexual generation of *Andricus crystallinus* Bassett. Gall measures 2.5 mm. in length and 1.0 mm. at base.

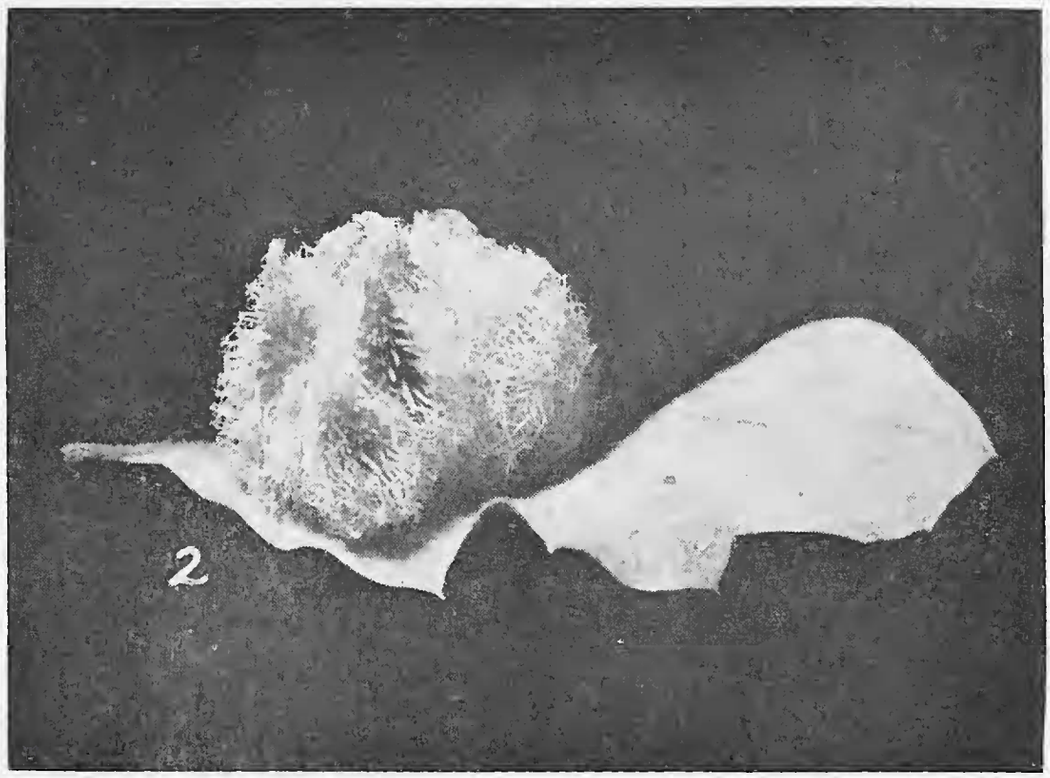


Figure 2. Cluster of galls produced by the unisexual generation of *A. crystallinus*. Dimension of this gall cluster approximately 15 mm. wide by 12 mm. high. Photographs by F. E. Skinner.

were reared in the laboratory at Albany, California, from agamic females obtained in galls collected at Mt. Diablo State Park, February 4, 1959. The series consisted of females and males. These specimens are housed in the collection of the Department of Biological Control, University of California, Albany.

Literature Cited

Doutt, R. L.
1959. Heterogony in Dryocosmus (Hymenoptera, Cynipidae). Ann. Ent. Soc. Amer. 52(1):69–74.

Lyon, R. J.
1959. An alternating, sexual generation in the gall wasp *Callirhytis pomiformis* (Ashm.) (Hymenoptera, Cynipidae). Bull. So. Calif. Acad. Sci. 58(1):33–37.

Weld, L. H.
1957. Cynipid galls of the Pacific slope. Privately published. Arlington, Va. 64 p.

A GOOSEBERRY CAMBIUM MINER

(Lepidoptera: Opostegidae)

In May 1956, a pest new to western North America was found doing serious injury in a commercial gooseberry patch near Forest Grove, Oregon. The larvae were identified by the U. S. National Museum as *Opostega* sp. near *nonstrigella* Chamb. The larvae of the moth were making linear feeding mines in the cambium of the gooseberry shoots. One or both ends of the mines recurved in a half circle so that each mine made a pattern of two parallel lines from four to ten inches long. Injured gooseberry plantings infested by the miner have been found generally in the Willamette Valley of Oregon.

The original description of *O. nonstrigella* by Chambers[1] gave gave no host or type locality. Grossenbacher[2] described the injury and gave life history notes from the Hudson Valley of New York. He thought a fungus was involved in the injurious effects but could not confirm the relation. In 1919, Caesar[3] reported it as injuring gooseberries from Burlington, Ontario.—R. G. Rosenstiel, *Department of Entomology, Oregon State College, Corvallis.*

---

[1] Chambers, V. T. 1881. New species of Tineina. Cin. Soc. Nat. Hist. Jour. 3(4):289-296.

[2] Grossenbacher, J. G. 1910. Medullary spots: a contribution to the life history of some cambium miners. N. Y. Agr. Exp. Sta. Tech. Bul. 15. Geneva.

[3] Caesar, Lawson. 1919. Insects as agents in the dissemination of plant diseases. 49 Ann. Rep. Ent. Soc. Ont. 1918:60-66.